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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Kenji Morita

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EXAMINER

WELCH, DAVID T

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,514	Applicant(s) MORITA ET AL.	
	Examiner DAVID T. WELCH	Art Unit 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-10,14 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10,14 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendments filed on October 7, 2009 have been entered. Claims 1-3, 14, and 16 have been amended. Claims 4, 11-13, 15, and 17 have been canceled. No claims have been added. Claims 1-3, 5-10, 14, and 16 are still pending in this application, with claims 1 and 14 being independent.

Claim Objections

2. Claims 1 and 14 are objected to because of a minor typographical error: at the end of the calculation limitations, the claims recite "included the virtual object". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 7, 8, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (U.S. Patent No. 5,999,185), referred herein as Kato, in view of Arbter et al. (U.S. Patent No. 6,545,663), referred herein as Arbter.

Regarding claim 1, Kato teaches an image processing method of generating a display image of a virtual space including a virtual object consisting of at least one part (abstract; column 6, lines 50-52), comprising: a first acquisition step of acquiring a position and orientation of a viewpoint of an observer (column 2, lines 38-50; column 17, lines 1-2); a second acquisition step of acquiring a position and orientation of a pointing device (figure 1, pointing device 3A; column 10, lines 53-55; column 17, lines 1-7); a calculation step of calculating a position of an object in the virtual space based on the positions of the viewpoint and the pointing device, wherein the calculated position of the object is near the position of the pointing device and closer to the position of the viewpoint than that of the pointing device (column 2, lines 38-50; column 17, lines 1-2, 11-13, and 26-28; column 28, lines 59-64; column 29, lines 3-7), and displaying a list image in the virtual space that represents a list of pieces of information about one or more parts, included in the virtual object, near the position of the pointing device; a layout step of laying out the list image in the virtual space (figure 18; figure 24; figures 25A, B, and C; column 6, lines 50-52; column 20, lines 27-44; column 21, lines 45-47 and 53-56; column 22, lines 62-66; column 23, lines 2-4, 18-23, 31-34, and 47-50); a virtual space image generation step of generating the display image of the virtual space, in which the laid out list image and the virtual object are included, on the basis of the acquired position and orientation of the viewpoint (Kato, column 2, lines 38-50; column 17, lines 1-2; column 20, lines 36-40; column 28, lines 59-64); and a composition step of composing the generated display image of the virtual space and an image of a physical space seen in accordance with the position and orientation of the viewpoint to display the composed image at a head mounted display mounted on the observer's head

Art Unit: 2628

(column 15, lines 58-62; column 17, lines 11-13 and 26-28; column 20, lines 36-40; column 25, lines 48-51; column 28, lines 59-64; column 29, lines 22-26). Kato does not teach the method, wherein the list image is positioned at the calculated position in the virtual space. Arbter teaches a method for processing the position of an object to be displayed in a virtual space, comprising a calculation step that calculates a position of an image of an object in the virtual space based on the positions of a viewpoint and a pointing device, wherein the calculated position is near the position of the pointing device (abstract, lines 1-6 and 15-19; column 1, lines 6-9 and 12-16; column 3, lines 15-20; column 4, lines 58-62; column 6, lines 16-25). As taught by Arbter, utilizing this position calculation enables a user to present visual information pertaining to the virtual objects in an easy and intuitive manner, and provides for efficient interaction with objects in the virtual space. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the position calculation disclosed by Arbter with the invention disclosed by Kato.

Regarding claim 2, Kato in view of Arbter teaches the method according to claim 1, and further teaches the method, wherein in the layout step, the list image is laid out at the orientation of the viewpoint (Kato, figure 18; figures 24A, B, and C; column 20, lines 27-44; column 21, lines 45-47 and 53-56; column 22, lines 62-66; column 23, lines 2-4, 18-23, 31-34, and 47-50; Arbter, column 4, lines 58-62; column 6, lines 16-25).

Regarding claim 3, Kato in view of Arbter teaches the method according to claim 1, and further teaches the method, wherein in the calculation step, the position of the list image is calculated to be a position that internally divides a line segment connecting between the positions of the viewpoint and the pointing device (Kato, column 20, lines 28-32 and 47-51; column 36, lines 35-49).

Regarding claim 7, Kato in view of Arbter teaches the method according to claim 1, and further teaches the method, characterized by further comprising a distance calculation step of calculating a distance between the position of the pointing device and the position of the virtual object (Kato, figures 35 and 36; column 29, lines 3-17), and a list image generation step of generating the list image to display the list of pieces of information about the parts up to a layer level corresponding to the distance calculated in the distance calculation step in a hierarchical structure of the parts included in the virtual object (Kato, figure 6; figures 48A, B, and C; column 11, lines 58-67; column 12, lines 1-7; column 35, lines 23-46).

Regarding claim 8, Kato in view of Arbter teaches the method according to claim 1, and further teaches the method, characterized in that the list image is an image to display a list of pieces of information about, of the parts included in the virtual object, a part at a position closest to the position of the pointing device acquired in the second acquisition step (Kato, column 17, lines 1-7 and 11-13; column 20, lines 27-44; column 21, lines 45-47 and 53-56; column 22, lines 62-66; column 23, lines 2-4, 18-23, 31-34, and 47-50).

Regarding claim 14, the limitations of this claim correspond to the limitations of claim 1; thus, they are rejected on the same grounds as the limitations of claims 1.

Regarding claim 16, Kato in view of Arbter teaches a computer-readable storage medium having a program stored therein, said program being characterized by causing a computer to execute an image processing method of claim 1 (Kato, figure 2, storage medium 7; figure 3, main program 18; column 10, line 67; column 11, lines 1-2; column 16, lines 50-51).

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Arbter, and further in view of Buxton et al. (U.S. Patent No. 6,118,427), referred herein as Buxton.

Regarding claim 5, Kato in view of Arbter teaches the method according to claim 1, but does not teach the method, characterized by further comprising a conversion step of converting the list image into a semitransparent image in accordance with an instruction to change the list image to the semitransparent image. Buxton teaches a method for optimal transparency processing in a graphical user interface to merge graphical images of objects, comprising conversion of the images into semitransparent images in accordance with an instruction to change the images to the semitransparent image (column 3, lines 40-46). As was very well known to those of ordinary skill in the art, and illustrated by Buxton, image transparency enables a user to view multiple layers of information without losing information that would otherwise be occluded by overlapping images, thus increasing the efficiency and simplicity of the user interaction, as well as improving the quality of the imaging system as a whole. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the semitransparent images of Buxton with the invention disclosed by Kato in view of Arbter.

Regarding claim 6, Kato in view of Arbter teaches the method according to claim 1, and further teaches the method, characterized by further comprising a determination step of determining on the basis of the position and orientation of the viewpoint and a

Art Unit: 2628

position of the virtual object whether the virtual object is present in a direction of line of sight of the viewpoint (Kato, column 17, lines 1-7; column 40, lines 55-63). Kato in view of Arbter does not teach the method, further comprising a transparency control step of, when it is determined in the determination step that the virtual object is present, making a transparency of the list image higher than that when it is determined in the determination step that the virtual object is not present. Buxton teaches a method for optimal transparency processing in a graphical user interface to merge graphical images of objects, comprising a transparency control step of, when it is determined that an object is present, making a transparency of an image higher than that when it is determined that an object is not present (column 3, lines 40-46; column 6, lines 58-65). As was very well known to those of ordinary skill in the art, and illustrated by Buxton, image transparency enables a user to view multiple layers of information without losing information that would otherwise be occluded by overlapping images, thus increasing the efficiency and simplicity of the user interaction, as well as improving the quality of the imaging system as a whole. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the transparent images of Buxton with the invention disclosed by Kato in view of Arbter.

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Arbter, and further in view of Stroyan (U.S. Patent No. 5,923,333), referred herein as Stroyan.

Regarding claim 9, Kato in view of Arbter teaches the method according to claim 1, and further teaches the method, characterized in that in the virtual space image generation step, when the list image overlaps a hand region in the physical space image acquired in the physical space image acquisition step (Kato, column 12, lines 18-26). Kato in view of Arbter does not explicitly teach the method, wherein the image of the virtual space is generated on the basis of priority data to designate which of the hand region and the list image should be rendered in front. Stroyan teaches a method for fast alpha transparency rendering, wherein an image of a virtual scene is generated on the basis of priority data to designate which of a plurality of virtual objects should be rendered in front (column 1, lines 57-67; column 2, lines 1-5). As was well known at the time of the invention, and illustrated by Stroyan, utilizing priority data to render objects in a virtual scene results in an accurate representation of the virtual scene, and accomplishes this in a fast and efficient manner. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the priority rendering method of Stroyan with the invention disclosed by Kato in view of Arbter.

Regarding claim 10, Kato in view of Arbter, further in view of Stroyan teaches the method according to claim 9, and further teaches the method, characterized by further comprising a designation step of designating which of the hand region and the list image should be rendered in front, wherein in the designation step, designated contents are set to the priority data (Stroyan, column 1, lines 57-67; column 2, lines 1-5).

Response to Arguments

7. Applicant's arguments, see page 8, filed October 7, 2009, with respect to the claim objections have been fully considered and are persuasive. The amendments to the claims are sufficient to overcome the informalities of the original claims; thus the objections to these claims have been withdrawn.

8. Applicant's arguments, see page 8, filed October 7, 2009, with respect to the 112 rejections have been fully considered and are persuasive. The amendments to the claims are sufficient to overcome the 112 rejections; thus the 112 rejections of these claims have been withdrawn.

9. Applicant's arguments with respect to claim 1 have been fully considered, but they are not persuasive. On page 9 of the Applicant's Remarks, the Applicant argues that Kato does not teach the claimed subject matter because 1) the position of menu 37 of Kato is not in the virtual space, and 2) menu 37 is at a fixed position, and is not calculated according to a position of a viewpoint of the user. Regarding the first argument, the Examiner respectfully submits that the Office Action relies on the list images of figures 25A-C, which are disclosed by Kato as being displayed in the virtual space. However, and in regard to the second argument, as discussed in the above Office Action, Kato does not disclose the amended limitation that the list image is positioned based on the calculated position. This, however, is moot in view of the new ground(s) of rejection.

Conclusion

10. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Neumann et al. (U.S. Patent Application Publication No. 2002/0191862);

Augmented-reality tool employing scene-feature auto-calibration during camera motion.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID T. WELCH whose telephone number is (571)270-5364. The examiner can normally be reached on Monday-Thursday, 8:00-5:30 EST, and alternate Fridays, 8:00-4:30 EST.

Art Unit: 2628

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on (571)272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/dtw/

/XIAO M. WU/

Supervisory Patent Examiner, Art Unit 2628